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Message Information

Date 08/30/2012 05:21 PM  
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Brown/OIG/USEPA/US@EPA  
Subject RE: Electronic Copy of Great Bay Municipal Coalition Letter to EPA  
Documenting Apparent Region I Scientific Misconduct and Agency Bias and  
Requesting Transfer of Matter to Independent Panel of Experts

Message Body

Dear Ms. Jackson and Mr. Elkins:

Attached please find an electronic copy of a supplemental letter sent on behalf of the Great Bay Municipal Coalition requesting IG action to investigate the allegations contained in our May 4, 2012 correspondence. (The relevant deposition exhibits will be sent under separate cover.) We had hoped that the information presented to the Office of Water would lead to an agreement that a new, independent peer review would be supported. However, no response to these requests was forthcoming. Thus it is apparent that the Office of Water does not intend to resolve these serious, well documented allegations of scientific and regulatory misconduct. Please proceed with an independent investigation as originally required, and further supplemented by the enclosed correspondence and information.

Sincerely,

*John*

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Letter to EPA L Jackson and A Elkins RE Scientific Misconduct - 8-30-12 - final.pdf



Transmittal Letter - GB Supplemental Comments - 8-30-12.pdf



Supplemental Permit Comments of the Great Bay Municipal Coalition based on Deposition Testimony - August 30, 2012-final.pdf



2012 5 14 Short Deposition Transcript Full Size.pdf pmcurrier 061212.pdf

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August 30, 2012

**VIA EMAIL & FIRST CLASS U.S. MAIL**

Lisa Jackson, Administrator  
Arthur A. Elkins, Jr., Inspector General  
U.S. Environmental Protection Agency  
Ariel Rios Building  
1200 Pennsylvania Avenue, N.W.  
Washington, D.C. 20460

**RE: Great Bay Nutrient Criteria and Permit Development - Documentation of Apparent Scientific Misconduct and Agency Bias; Request for Transfer of Matter to Chesapeake Bay Office for Independent Review**

Dear Administrator Jackson and Inspector General Elkins:

As you are aware, on May 4, 2012 the Great Bay Municipal Coalition requested an independent review of actions by EPA Region I with respect to nutrient regulation for the Great Bay Estuary. That letter provided considerable documentation of actions that the Coalition believed constituted since misconduct. Since that initial submission, we had requested that the Inspector General's (IG's) Office defer a formal investigation pending discussion of the matter with the Office of Water. It was hoped that those discussions would lead to an agreement that another, independent peer review would be supported by EPA Headquarters. Unfortunately, despite Congressional support for such action as a means to resolve the matter and the group's proffer of sworn deposition testimony confirming the basis of our original request was well founded (see, July 13, 2012 letter to Ellen Gilinsky), no response has been forthcoming. We therefore ask that the IGs Office initiate its review of the serious improprieties that were documented in our original correspondence and confirmed by the depositions of key state officials. (See, attachments, including deposition transcripts)

As discussed in the attached supplemental permit comments, these depositions confirmed that:

1. EPA first informed the state it must formally adopt the new numeric nutrient criteria and then, after CLF threatened to sue EPA if Great Bay wasn't listed as nutrient impaired, EPA told the state criteria adoption wasn't needed. This plainly violated federal law and local due process rights.

## **HALL & ASSOCIATES**

2. EPA was under contract to assist the state on nutrient criteria development and was fully aware of the studies showing nitrogen increases in the estuary had not caused adverse impacts on water quality parameters such as algal levels or transparency. EPA asserted nutrient criteria had to be developed in any event and promoted a transparency approach nonetheless.
3. The nutrient criteria document developed by DES with EPA assistance did not include the prior information and findings of studies confirming that nitrogen had not caused adverse impacts. Rather, the analysis was based on a claimed nitrogen transparency relationship that was known to be in error and not represent a “cause and effect” relationship. Consequently, the “peer review” conducted by the Region was purposefully biased to avoid disclosure of information confirming the criteria were not scientifically defensible.
4. Although available data did not show the Great Bay was nutrient impaired, EPA asked DES to change the impairment listing to “nitrogen impaired” to avoid a potential lawsuit with CLF.

In summary, the depositions confirm that scientific and regulatory misconduct has occurred, as originally claimed by the Coalition. Critical scientific information was purposefully excluded from the “weight of evidence” criteria that EPA had a primary role in developing for the Great Bay estuary. Moreover, that information was knowingly shielded from both public and peer review to avoid a finding that the proposed criteria were technically flawed. Wholly improper and unsupported listing decisions were promoted by EPA to appease CLF – regardless of the fact that no objective scientific information from Great Bay supported the position that increasing nitrogen levels had caused a loss in eelgrass populations. Finally, to justify the changed impairment listing, EPA recommended that the state violate federal law by using an unadopted (and scientifically fraudulent) draft numeric criteria to support that action.

Given this information, confirmed by sworn testimony of state officials and local experts familiar with these events, we ask that the IG’s office proceed with its investigation, as it is apparent that the Office of Water has no intention of rectifying these serious violations of ethical duties, statutory mandates and administrative law.

Please do not hesitate to contact me if you have any question regarding the enclosed information or allegations contained herein.

Respectfully submitted,

/s/

John C. Hall

Enclosures

## **HALL & ASSOCIATES**

cc: Coalition Members  
Curt Spaulding, Administrator of EPA Region I  
Thomas Burack, Commissioner of NH DES  
Gov. John Lynch  
Rep. Frank Guinta  
Sen. Jeanne Shaheen  
Sen. Kelly Ayotte  
Rep. Darrell Issa

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August 30, 2012

### VIA U.S. FIRST CLASS MAIL & E-MAIL

Stephen S. Perkins  
Director, Office of Ecosystem Protection  
U.S. Environmental Protection Agency - Region 1  
5 Post Office Square - Suite 100  
Boston, MA 02109-3912

**RE: Supplemental Comments in Response to Proposed Draft NPDES Permits for the City of Dover, NH – NPDES Permit No. NH0101311, Town of Exeter, NH NPDES Permit No. NH0100871 and Town of Newmarket, NH NPDES Permit No. NH0100196**

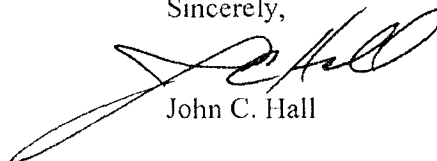
Dear Mr. Perkins:

The Great Bay Municipal Coalition (the Coalition) is an organization dedicated to the establishment of appropriate and cost-effective restoration measures to protect Great Bay and its resources. The Coalition represents the six major communities whose wastewater flows into various parts of the Great Bay system – Dover, Durham, Exeter, Newmarket, Portsmouth, and Rochester.

Per my email dated August 15, 2012, I am submitting supplemental comments (attached) based on information not previously available at the time permit comments were due for the proposed draft NPDES permits referenced above. This letter provides the specific references to sworn testimony given by Philip Trowbridge, Dr. Fred Short, and Paul Currier that confirms, *inter alia*, there are no data or studies showing nitrogen induced cultural eutrophication of Great Bay has occurred. This testimony also confirms that EPA has misapplied the state's narrative criteria in developing the proposed permits and in concluding that nitrogen reduction is necessary to allow for eelgrass propagation in this system. Copies of full depositions with exhibits will be submitted to EPA by local counsel for the permittees. Copies of the deposition transcripts are being provided electronically with this filing.

Thank you for your consideration of these supplemental comments.

Sincerely,



John C. Hall

Enclosures

cc: Coalition Members  
Ted Diers, DES

## Supplemental Comments of the Great Bay Municipal Coalition

The following information, not previously available at the time permit comments were due, is hereby submitted in response to the proposed draft NPDES permits for the cities of Dover, Exeter and Newmarket. As discussed below, this new information demonstrates that the proposed stringent nitrogen limitations are not scientifically justified and fail to reflect applicable state narrative standards that were purported to be the basis for developing the draft permits. Given this new information, most based on sworn testimony, the need for stringent nitrogen limitations is not legally or technically justified. Consequently, the proposed permits should be withdrawn.

### 1. Use of the Draft 2009 Criteria Did Not Implement Existing State Narrative Criteria or Demonstrate Narrative Criteria Violations Existed.

Currently, the only duly promulgated New Hampshire water quality criteria addressing nutrients in estuaries are found at Env-Wq 1703.14(b), which states:

Class B waters shall contain no phosphorus or nitrogen *in such concentrations that would impair any existing or designated uses, unless naturally occurring.* (emphasis supplied). The regulations continue:

Existing discharges containing either phosphorus or nitrogen which encourage cultural eutrophication shall be treated ... to ensure attainment and maintenance of water quality standards. Env-Wq 1703.14(c).

“Cultural eutrophication” is defined as “human-induced addition of wastes containing nutrients to surface waters which results in excessive plant growth and/or a decrease in dissolved oxygen.” Env-Wq 1702.15.

DES also has a narrative standard regarding “aquatic community integrity,” which indicates, in relevant part, that “differences from naturally occurring conditions shall be limited to non-detrimental differences in community structure and function.” Env-Wq 1703.19(b).

The key evidentiary component of the narrative nutrient criterion is that a violation is only found when it is demonstrated that nutrients *are causing* the impairment (e.g., “in such concentrations that would impair”; “human-induced addition of ... nutrients ... which results in”). As discussed below, this essentially requires a “cause and effect” demonstration to find a violation of the narrative criteria. In issuing the draft permits, EPA indicated that it was relying on the states existing narrative criteria as the basis for (1) finding nutrients were the cause of impairments and (2) using the 2009 Numeric Nutrient Criteria as a “narrative translator.” Our prior comments noted that to claim a nutrient limitation is necessary to eliminate use impairments and protect ecological resources under the state’s narrative

standard, EPA must first demonstrate that the nutrient at issue (nitrogen) caused the impairment, otherwise defined as “cultural eutrophication” (excessive algal growth causing impairment such as DO violations – Env-Wq 1702.15) under state law. Moreover, any “narrative translator” must be based on a system-specific defined “cause and effect” relationship showing the nutrients have caused such “cultural eutrophication.” The permit action is premised on the *assumption* that the waters are nutrient impaired, which itself was based on application of the 2009 Criteria in the Section 303(d) process. The Coalition noted that because the 2009 Criteria, at best, demonstrated a correlation and did not prove causation (and was not based on a demonstrated site-specific causal relationship for Great Bay estuary), such criteria could not be used as a proper “narrative translator” or as a scientifically defensible basis for demonstrating that the waters were actually nutrient impaired in violation of the narrative criteria. Moreover, it was further noted that algal levels had not changed despite the claimed increase in DIN levels in the system. (State of Estuaries Reports 2000, 2003, 2006 and 2009) Thus, there was no indication that “cultural eutrophication” has occurred as a result of the alleged changing DIN levels and thus no evidence of narrative criteria violations. The data evaluation for the 2012 SOE also confirmed no significant change in algal levels in 40 years despite a 60 percent increase then 40% decrease in inorganic nitrogen levels. (Exh.1- Long term average nutrient and algal levels at Adams Point)

**a) Deposition Testimony Confirm No Cause and Effect Demonstration**

Mr. Paul Currier of DES confirmed that any claim of narrative criteria violations requires a documented *causal relationship* between nutrients and excessive plant growth adversely impacting designated uses (*See* Currier Dep. at 18, 19, 134)<sup>1</sup>. Both Mr. Trowbridge and Mr. Currier confirmed that the 2009 Criteria is not based on a demonstrated causal relationship for either transparency or DO. (*See*, Currier Dep. at 77, 80, 147; Trowbridge Dep. at 413-416, 445-446; Short Dep. at 173-175) The relationships were only correlations – a fact EPA itself knew in 2008. (Trowbridge Dep. Exh. 88) Thus, the 2009 Numeric Nutrient Criteria, cannot be a proper translator of the existing narrative criteria, as a correlation does not establish that a causal relationship exists and the narrative criteria requires a causal demonstration. *Id.* Moreover, both Mr. Currier and Mr. Trowbridge noted that merely exceeding values contained in the 2009 Criteria does not provide a demonstration that a narrative violation exists. (Currier Dep. at 80; Trowbridge Dep. at 332-333) Thus, in designating the waters nutrient impaired in 2009 and thereafter, DES had made this presumption which is now admitted to be insufficient to actually declare those waters as nutrient impaired or to calculate permit requirements to meet narrative standards.

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<sup>1</sup> Full copies of the Currier, Short and Trowbridge Depositions, plus exhibits have been provided to EPA by the Coalition’s local counsel. Due to the voluminous nature of those documents they are not being resubmitted with these comments.

Based on these sworn acknowledgements on how state law is intended to operate, it was improper for EPA to presume that the exceeding the 2009 Criteria levels will or has caused eelgrass or DO impairment anywhere in the system. It was equally improper for EPA to presume that attaining compliance with the numeric values contained in the draft 2009 Numeric Criteria document, was necessary to avoid violating the state's narrative criteria. Finally, it was also improper to presume that, the 2009 Criteria accurately reflected the level of scientific demonstration required by the existing narrative standard to designate waters as nutrient impaired. In short, the 2009 Criteria reflected a series of unproven assumptions on conditions that may occur in estuaries but are not proven to be occurring in Great Bay estuary. Such speculation is not a basis for narrative criteria implementation and does not constitute "weight of evidence" that nutrients have triggered narrative criteria violations as assumed in EPA's proposed permitting action.

**b) Available DES Analyses Confirmed No Narrative Criteria Violation Existed**

EPA's permit action is premised on the assumption that nitrogen has caused narrative criteria violations and major nutrient levels are necessary to restore this system. These presumptions are also in error. There is no nitrogen-related eelgrass impairment demonstrated by any of the available site-specific data for this system. Mr. Trowbridge indicated that his prior research confirmed that nitrogen was not causing adverse water quality in Great Bay estuary. (See, Dep. Exh., 31, 32, 71 and 72) In particular, the following "findings" resulted from these data assessments and analyses:

- Nitrogen increased but algal levels did not change in the system.
- Algal levels are a minor component influencing system transparency; turbidity and color are the most important factors;
- There is no indication that transparency changed from 1990 through 2007 during the period of nutrient concentration increases.

EPA had been provided with these results via PREP and NHEP, but chose not to include them in rendering a determination that nitrogen reduction was required to address a narrative criteria violation associated with "transparency" and restore eelgrass populations. Mr. Trowbridge presented EPA with a PowerPoint review of his analyses confirming no such TN-algal-transparency connection existed for the Great Bay estuary in March 2008. Mr. Trowbridge acknowledged the assessment presented was accurate. Therefore, the subsequent "weight of evidence" analysis performed by EPA and DES in support of nutrient reduction that ignored these critical findings was deficient and entirely misplaced.<sup>2</sup> Elevated levels of

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<sup>2</sup> It is apparent that both the state and EPA knew that these numeric criteria were based on confounded correlations that did not show TN caused the claimed changes in either transparency or DO (See Exh. 71, 72

TN can, but do not necessarily cause transparency impairments by stimulating excessive algal growth indicated by elevated chlorophyll-a concentrations. In the case of Great Bay, while TN increased 59% since 1980 through 2008, there was no corresponding increase in algal growth (Exh. 1 and Trowbridge Dep. 121-127). Accordingly, cultural eutrophication (i.e., documented negative impacts on uses due to excessive nutrient inputs), did not occur in Great Bay or the Piscataqua River up to 2007 as confirmed by Mr. Trowbridge (*See* Trowbridge Dep. at 326-328, 355-356, 433-434 and Currier 62-63, 69). Moreover, the 2007 transparency study completed by Morrison (Trowbridge, co-author) for Great Bay, concluded transparency was sufficient to support eelgrass in Great Bay and Little Bay and therefore other factors must be limiting eelgrass declines in the system. (Trowbridge Dep. at 235-236). This critical finding was left out of the 2009 Criteria document (Trowbridge Dep. at 436-438).

The analysis of algal growth for Great Bay, Adams Point, recently released by Mr. Trowbridge to the PREP Technical Advisory Committee, further confirms that no material change in algal level occurred since 1970s, despite increasing then decreasing DIN levels. (Exh. 1 - PREP 2012 Nutrient and Algal Charts for Adams Point) As no causal relationship has been documented between TN and algal growth adversely impacting transparency or low DO, there is no documented narrative criteria violation for nutrients (with no induced change, there can be no “cultural eutrophication”). Therefore, EPA’s reliance on the impaired waters listings (that in turn relied on the 2009 Criteria) was misplaced and all permit calculations and requirements based on that impairment presumption are flawed. There is no demonstrable causal relationship between TN/TIN and algal growth, eelgrass loss, transparency decrease or minimum DO anywhere in the system. In summary, there are no documented cases, anywhere in the estuary, where increased nutrient levels have (1) caused eelgrass losses via any possible mechanism and (2) where transparency has been significantly decreased due to increased algal growth stimulated by increased nutrient loadings. The data and available studies (Jones, Pennock, HydroQual) do not show that algal growth is a significant contributor to low DO that occurs in virtually every tidal river. Absent, such information and a demonstration of a direct relationship to increased nutrient loadings, there can be no claim that narrative criteria violations are caused by nutrients from POTWs or that nutrient reduction will materially improve these conditions.

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and 88 – Trowbridge Dep.). This admission paired with the absence of legitimate scientific evidence renders the proposed TN criterion unsupportable as a narrative criterion implementation method. It also provides clear evidence that EPA intentionally overlooked the relevant scientific information in asking DES to claim that narrative criteria violations were caused by nutrient loads to the system. (Currier Dep. Exh. 34). Mr. Currier noted in his deposition that the 2009 Criteria would have been pulled back if the peer reviewers had concluded the analysis did not demonstrate cause and effect but was merely a correlation. (Currier Dep. at 147.) Thus, this was a very material, intentional omission from the technical reports used by EPA to claim stringent TN requirements are necessary.

## **2. Narrative Violation Related to Eelgrass Has Not Occurred in Tidal Rivers.**

As noted in the prior comments and the regulatory citations listed above, changes in ecology due to natural conditions do not constitute narrative criteria violations or system impairments. EPA has proposed a transparency-based TN criterion be applied in the tidal rivers of Great Bay for the purpose of restoring eelgrass in these areas. As noted earlier, EPA assumed that algal growth had a major influence on transparency in the tidal rivers, again relying on the 2009 Criteria document – rather than looking at the relevant site-specific information for each of the tidal rivers. EPA claims this is necessary because eelgrass historically existed in these areas. The Coalition presented data from the tidal rivers confirming that TN negligibly impacts transparency and low tidal river transparency is a naturally occurring condition due to turbidity and CDOM occurring in those waters (e.g., Squamscott, Lamprey and Upper Piscataqua Rivers). Therefore, it would be improper to apply a TN criterion based on transparency, or to find any eelgrass impairment exists in such waters. Where natural transparency limits eelgrass growth in the tidal rivers or the effect of TN is negligible, there can be no “nutrient related” eelgrass/transparency” violation occurring in these waters. Therefore, EPA’s application of the transparency-based TN criteria to set permit limits for the various tidal river facilities was unsupported factually and unnecessary to ensure compliance with the existing narrative standards.

Under deposition, Mr. Currier acknowledged that the mere historical presence of eelgrass in an area is not a sufficient basis to regulate nutrients. (Currier Dep. at 130-131). He further noted that it would be improper to apply the 2009 Numeric Nutrient Criteria to protect eelgrass if the data confirmed other factors were limiting eelgrass propagation. Id at 136-137. Based on a review of the very data submitted by the Coalition in its permit comments (Short Dep. Exh. 20-22), Mr. Trowbridge acknowledged that transparency is too poor in the major tidal rivers (Squamscott, Lamprey, Upper Piscataqua) to support eelgrass growth, due to the amount of color and turbidity present. (Trowbridge Dep. at 409-10, 421-428, 431-434). He acknowledged that both factors are naturally occurring in the watersheds. Id. at 427-431. With regard to the Exeter permit, Mr. Trowbridge agreed that reducing TN would have no meaningful effect on improving transparency in this tidal river. Id. He acknowledged that these available data not previously analyzed by DES in developing the 2009 Criteria document shows that (1) the effect of algal growth on transparency is negligible (2) CDOM and turbidity are the key factors controlling transparency in the tidal rivers system, (3) CDOM and turbidity in the tidal rivers come from natural sources and are not caused by nitrogen loadings and (4) regulating TN in the tidal rivers will not result in any demonstrable improvement in transparency. These are *precisely* the type of data and finding that Mr. Currier stated would obviate the need to achieve the recommendations contained in the 2009 Numeric Nutrient Criteria document. As such, imposition of the transparency-based TN

criterion by EPA to restore eelgrass in any of the tidal rivers is scientifically unsupported and not demonstrated necessary to comply with the applicable narrative standards. Given this testimony and the available data, there is no reasonable basis to impose nutrient reduction measures to protect eelgrass populations that do not and cannot exist due to factors unrelated to nutrients. It is per se unreasonable for EPA to seek to impose a TN criteria based on a transparency target ( $K_d$  of 0.75/m) that cannot and will not be achieved in the tidal rivers due to a host of factors unrelated to nutrient levels. Generally speaking, a State is the sole arbiter of its own regulations. See *United States Corp. v. Train*, 556 F.2d 822, 837-39 (7th Cir. 1977) (Federal courts and agencies are without authority to review the validity of requirements imposed under state law or in a state's certification). Moreover, it is per se legal error for EPA to implement the state narrative criteria in a manner inconsistent with the states interpretation of its own laws. *Kentucky Waterways Alliance v. Johnson*, 540 F.3d 469, 493 n.1 (6th Cir. 2008) ("In interpreting a state's water quality standard, ambiguities must be resolved by consulting with the state and relying on authorized state interpretations") (concurring opinion of Judge Cook relied on by Court, 540 F.3d at 469)

As eelgrass in the tidal rivers will not and cannot be restored due to natural conditions unrelated to nutrients or the degree of algal growth or nutrients present, nutrient regulation in these waters is not permissible based on eelgrass protection under either the aquatic community integrity or the narrative nutrient criteria.

### **3. Post 2006 Eelgrass Population Decreases in Great Bay and Lower Piscataqua River Could Not Possibly Have Been Due to Nitrogen**

The main factor influencing the call for stringent nutrient regulation was the post-2005 decline in Great Bay and lower Piscataqua River eelgrass populations. Prior to this time, neither area was considered impaired for eelgrass (See, Trowbridge Dep. at 356; Currier Dep. at 62-63, 69; Short Dep. at 120-125; see also, figures presented in Trowbridge March 2008 presentation to USEPA showing stable eelgrass acreage in both areas). The Section 303(d) listing record confirmed that the post-2005 dramatic eelgrass decreases in Great Bay and Lower Piscataqua River and litigation threats by CLF were the driving factors for claiming Great Bay was impaired and TN was the cause. (Currier Dep. at 78-79, 97 and Dep. Exh. 34 - internal DES email stating EPA requested the impairment listing change to avoid CLF suit). NOTHING in the record at that time or since then shows that nitrogen had anything to do with the dramatic eelgrass decline in 2006/2007. (Trowbridge Dep. at 370-372). There is no evidence showing nutrients triggered any type of significant water quality change affecting

eelgrass, and, given the rapid decline, this would have been virtually impossible to be a nutrient induced impact.<sup>3</sup>

With regard to the rapid decrease in eelgrass post 2005, it was acknowledged that rainfall and flooding could have been the cause of the decreased eelgrass populations. (Trowbridge Dep. at 381-384, 436). This hydrologic condition greatly influenced system salinity (CDOM and salinity are inversely correlated) and low salinity does have a direct and immediate impact on eelgrass health. (See, [www.SeagrassLI.org/ecology/physical\\_environment/salinity.html](http://www.SeagrassLI.org/ecology/physical_environment/salinity.html)) At lower salinity levels (10-20 ppt), eelgrass growth decreases sharply. Id. The attached figures shows how CDOM levels in Great Bay increased during these extreme rainfall years and therefore, salinity levels in the system decreased substantially. Increased CDOM due to the flooding events also cause a major decline in light transmission for Great Bay in the Spring of 2006, which has improved since then. Exh. 2- Changing CDOM Levels in Great Bay 2005-2011 and Exh. 3 - Changing Light Transmission in Great Bay 2004-2008. It should be noted that, the reduced transparency in the system in 2006 was NOT due to an explosion in algal growth. The attached figure shows eelgrass decline as a function of freshwater inflow to the system and the changing transparency condition in Great Bay due to the 2006 floods. Id. This poor level of water clarity occurring in the peak growing season along with lower salinity would have adversely impacted eelgrass growth. Similar storm/flood related eelgrass declines have been reported in other systems. (see, *Managing Seagrasses for Resilience to Climate Change*, Bork, Short, Mcleod and Beer, International Union for Conservation of Nature (2008)) at 18. Multiyear (three year or more) recovery to such natural events have been documented and would be expected in this system also. Id.

Similar to flood impacts documented in other systems, the multi-year depression in eelgrass growth (2006-2008) is most likely attributed to changing conditions related to increased fresh water flows, decreased salinity and poor light transmission occurring in the higher rainfall years and in particular the spring of 2006. (See, Exh. 4 – Changing Great Bay Eelgrass Acreage and Flow; Exh. 5 - Chart of May-July Flows Versus Eelgrass Acreage). Since the extreme rainfall has abated, eelgrass populations have rebounded in both Great Bay and Little Bay for 2010-2011. Id. Therefore, at this point there is no rational basis to conclude

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<sup>3</sup> EPA's position that nitrogen was the cause of eelgrass declines rested on claims made by Dr. Short. There is no objective basis for relying on Dr. Short's claims. He testified that he did not conduct studies of Great Bay or the Lower Piscataqua River designed to determine why eelgrass declines had occurred in those areas. (Short Dep. at 16, 20-22, 24-25, 83-85) He also testified that he did not conduct any evaluation of the available water quality data to ascertain whether or not nutrients had triggered any changes in water quality impacting transparency. (Id.) Thus, his "claims" were simply unsupported speculation. He also acknowledged that he did not know why eelgrass populations in Little Bay failed to "rebound" while Great Bay eelgrass populations fully recovered after the 1988 wasting disease event that decimated eelgrass populations in the area. Id. Thus, none of Dr. Short's claims regarding the cause of fluctuating eelgrass populations are objectively demonstrated for the Estuary.

that anything other than natural conditions (in particular floods and extreme rainfall occurring in 2006) has caused the rapid decline in 2006 eelgrass acreage that persisted for three years. A multiyear recovery period would be expected as necessary to allow for pre-flood eelgrass populations to again occur, which is also reflected in the Great Bay/Little Bay eelgrass record. EPA's assertion that this was a nitrogen induced impact has no objective scientific basis for this estuary and no explainable ecological mechanism. Changing eelgrass populations in the Lower Piscataqua River and the Bays is not related to nitrogen impacts but is most likely due to events surrounding the floods occurring in 2006.

#### **4. The Transparency Concern in Great Bay is Misplaced and Unsupported**

The proposed nutrient standards are based on a presumed transparency impairment in Great Bay. However, transparency in Great Bay has been consistent and supportive of eelgrass propagation. As previously mentioned, Great Bay transparency was fairly constant from 1990-2005 and 2007-2011. This level of transparency has been sufficient to sustain eelgrass in Great Bay. DES, EPA, and Dr. Fred Short have all agreed that Great Bay is not a transparency limited system because eelgrass populations receive sufficient light during the course of the tidal cycle (Trowbridge Dep. at 177, 211-212, 360-361 and Short Dep. at--- as discussed in numerous emails between DES, EPA and Dr. Short). Moreover, the 2007 transparency study completed by Morrison for Great Bay concluded transparency was sufficient to support eelgrass in Great Bay and Little Bay and therefore other factors must be limiting eelgrass declines in the system. (Trowbridge Dep. at 235-236). In other words, eelgrass populations in Great Bay generally receive ample light at low tides, unless conditions become severe (as in 2006 floods and extreme rainfall). These critical findings were left out of the 2009 Criteria document. Id at 436-437. Because Great Bay transparency is sufficient for eelgrass growth, application of the 2009 Numeric Nutrient Criteria to derive the permit limits is not legally or scientifically defensible.

#### **5. The Current and Historical Water Quality in Great Bay Has Been Sufficient to Support Eelgrass.**

The Coalition previously observed that an evaluation of historical data indicate that water quality conditions in the Great Bay in excess of the 2009 Numeric Nutrient Criteria have been conducive and sufficient for eelgrass growth. Eelgrass populations thrived from 1990 through 2005 under the elevated TN conditions and existing transparency conditions documented in Great Bay and Piscataqua River. For example, the database presented by Mr. Trowbridge to EPA in March 2008 confirmed that the average Kd for Great Bay was above 1.0 and TN above 0.42 mg/l prior to 2006 when eelgrass were considered healthy. This proves that a 0.75 Kd, and 0.3 mg/l TN criteria as presented in the 2009 Numeric Nutrient Criteria are not necessary to ensure adequate eelgrass growth in this system.

Deposition testimony has confirmed that the Coalitions position is supported. Mr. Currier indicated that conditions occurring prior to 2004 were sufficient to protect eelgrass resources (Currier Dep. at 69). Mr. Trowbridge also acknowledged the same position through 2005. (Trowbridge Dep. at 356) Mr. Trowbridge also acknowledged that the major regrowth of eelgrass also indicates that existing water quality supports healthy eelgrass propagation. (Trowbridge Dep. at 182-183 240-241) Finally, federally funded research (2008- Morrison) on Great Bay confirmed that (1) existing light conditions were sufficient for eelgrass growth (2) changes in eelgrass populations are not related to transparency and (3) other causes require investigation (Currier, Trowbridge Dep. at 236, 360-361). Existing transparency levels are as good, if not better than the levels present during the Morrison study. (Exh. 3- Showing Kd at Adams Point 2004-2008) Given this testimony, there is no objective basis to assert that existing water quality and nutrient levels are inadequate to support the eelgrass resource or that transparency and nitrogen levels violate narrative criteria.

Epiphytes have been raised as an issue of concern for Great Bay eelgrass. Epiphytes grow on the surface of the eelgrass and attenuate the light reaching the eelgrass. This can hinder eelgrass growth to varying degrees. However, Mr. Trowbridge agreed with Dr. Short's assertion that epiphytes pose negligible risk to Great Bay eelgrass populations (Trowbridge Dep. at 7-11-12 pg. 348-349).

Similarly, macroalgae can overgrow eelgrass beds and prevent eelgrass proliferation. Yet, Mr. Trowbridge did not oppose Dr. Short's findings that current macroalgae growth has not been demonstrated to prevent eelgrass restoration anywhere in Great Bay (Trowbridge Exh. 58; Trowbridge Dep. at 104-105). It should be noted further, that macroalgae in Great Bay grow predominantly on tidal flats that do not support eelgrass. Regardless of macroalgae levels, eelgrass populations in Great Bay rebounded roughly 40% from 2007-2011 (Trowbridge Dep. at 156-157, 240-241). Clearly, macroalgae growth has minimal, if any, effect on Great Bay eelgrass and the growth of these plants has not been documented to be causing use impairment. *Id.*

Thus, available data indicate current and historical water quality conditions support eelgrass growth and that existing nutrient levels do not pose a present threat to eelgrass survival. Therefore, imposing stringent nutrient reduction requirements, as proposed in the draft permits, is unnecessary and unwarranted to support eelgrass growth in Great Bay.

#### **6. The Cause of Eelgrass Decline is Unknown.**

EPA and DES have claimed to understand causes of eelgrass decline. Contrary to EPA and DES claims, available data indicate eelgrass decline is not linked to increased TN levels in Great Bay. However, the true cause of eelgrass decline remains unknown. Mr. Phil Trowbridge confirmed that causes of Great Bay eelgrass decline from 2006-2008 are not understood (Trowbridge Dep. at 82-83, 370-372). This is attributable to the fact that no site-

specific research has been completed to evaluate the cause of eelgrass declines anywhere in the Great Bay system (Trowbridge Dep. at 120-125, 135-136, 149-150, 152, 408; Short Dep. at 16, 20-25). Instead, the development of the proposed nutrient criteria relied heavily upon studies of the Chesapeake Bay, a considerably different system than Great Bay. Without understanding the underlying causes of Great Bay eelgrass decline, imposing nutrient criteria is unsupportable.

**7. Low DO in Tidal Rivers is Not Demonstrated to be Caused by Algal Growth.**

EPA has claimed the low DO in Great Bay tidal rivers is caused by excessive algal growth. The Coalition comments note that the available studies specifically determined that there was no direct relationship between periodic low DO and elevated algal levels in the rivers that were evaluated (i.e., Lamprey and Squamscott). The recent HydroQual report indicated that elevated algal levels exhibit no direct relationship with low DO (Trowbridge Dep. at 31-32). Prior State of the Estuary reports indicated that natural conditions may cause the low DO. Mr. Trowbridge acknowledged several natural conditions contribute to low DO in the tidal rivers, including tidal interchange, stratification, and sediment oxygen demand (Trowbridge at Dep. at 39-46). Mr. Trowbridge also acknowledged that the relative impacts of algal growth versus all other factors influencing low DO have not been assessed. *Id.* Without such assessments, algal growth cannot and has not been pinpointed as the primary or even a significant cause of low DO in Great Bay tidal rivers. Without such basic information the need for stringent nitrogen reduction cannot be determined. Applying nutrient criteria to limit algal growth as a means to increase DO in Great Bay tidal rivers is scientifically unsupportable at this time, particularly given the data showing that prior apparent increases in inorganic nitrogen levels did not produce a significant change in algal growth in the system.

**8. EPA Peer Review and Permit Issuance Failed to Consider the Relevant Scientific Information for Great Bay.**

EPA has claimed the peer review conducted for Great Bay was adequate to demonstrate application of stringent nutrient criteria were necessary to protect the Bay's eelgrass resources. However, the Coalition asserted that the peer review failed to consider the relevant scientific information previously developed for Great Bay estuary. The depositions confirmed that critical site-specific information in the possession of DES and EPA was excluded from the 2009 Numeric Nutrient Criteria and therefore, was not made available to the peer reviewers. (Trowbridge Dep. at 436-440) The various DES analyses (discussed earlier) that confirmed (1) TN increases did not cause changes in transparency, algal levels or DO (2) a "cause and effect" relationship between TN and transparency/DO did not exist, (3) Dr. Short's conclusion that Great Bay is not a transparency-limited system and (4) the

findings of the Morrison report concluding existing conditions (transparency/TN) did not limit eelgrass populations were all excluded from the technical information presented in the 2009 Numeric Nutrient Criteria support documents “weight of evidence” analysis. Consequently, the peer reviewers had no basis to know that the assumptions underlying the development of the criteria, were actually proven to be unsupported or false by the available site-specific data. Moreover, the effect of the extreme weather on eelgrass populations was never presented, though it was acknowledged that it could have caused the eelgrass losses. (Trowbridge Dep. at 381-385, 436) Excluding such essential and relevant information, rendered the peer review a fatally flawed and biased process. This information confirms that the concerns identified in the Coalition’s May 14, 2012 Science Misconduct letter to EPA Headquarters were well supported.

## **9. Extreme Rainfall Skewed Nitrogen Impacts Analysis.**

As part of the Coalition’s comments, it was noted that the time period used to evaluate the degree of nutrients entering the system was atypical and not reflective of the expected range of nitrogen loadings. In particular, EPA was relying on a DES 2010 draft WLA Report that considered system loadings from the 2006-2008. The depositions confirmed that this was an extreme rainfall period (Trowbridge Dep. at 436) and more recent water quality data (released by PREP) confirmed that nutrient levels have declined by approximately 40% in the past three years. (Exh. 1 showing 1970- 2011 inorganic and total nutrient levels at Adams Point) As noted previously, this change in weather patterns has been accompanied by eelgrass regrowth in Little Bay and Great Bay. The external loading of nitrogen has dropped substantially based on the most recent PREP analysis from 1560 tons per year to about 1200 tons per year (see, Draft 2012 State of Estuary report).

State criteria do not have to be met under extreme conditions akin to once in 100 year events. Those would be considered extreme natural disturbances. Based on this information, *assuming arguendo*, that nutrient reductions are needed, the degree of nutrient reduction required to attain the 2009 Criteria is far less than originally believed by EPA. In fact, it appears that the existing TN level in Great Bay, is actually at or below the level intended to regulate macroalgae growth ~ 0.37 mg/l TN. Since Great Bay does not have a phytoplankton/transparency issue – it is only this level of water quality that could be considered needed to protect eelgrass uses at this time. Based on this latest information on nutrient levels in the system, EPA necessarily must reconsider its claim that limits of technology TN reductions to 3 mg/l TN is required to protect the resources of Great Bay.

#### **10. Draft Criteria Were Misapplied (7/Q/10-mixing zone)**

The Coalition comments noted that EPA had misapplied the 2009 Numeric Nutrient Criteria by imposing restrictive mixing zones and by applying the criteria under rare low flow conditions. The depositions confirmed both of these errors (See Trowbridge Dep. at 441-445; Currier Dep. at 103). In particular, the application of the numeric criteria under short-term, rare low flow conditions and at the end of a reduced mixing zone was completely at odds with the development of the criteria, which were based on long-term, median (multiyear) conditions in ambient exposure levels. *Id.* Therefore, the Region misapplied the criteria and the calculations that were used to assess the degree of impact from the discharge, were all in error (assuming that the nutrients being discharged were actually causing demonstrable adverse impacts).

#### **11. Improper Impairment List Based on CLF Influence and Further Verification of Science Misconduct in the Development of the Permit Requirements**

The Coalition had raised concerns regarding the claims that Great Bay was eelgrass impaired due to nutrients and why the impairment listing changed prior to the opportunity for the public to formally comment on the legal and technical basis of the draft 2009 Numeric Nutrient Criteria. Mr. Currier acknowledged that the 2009 Criteria changed and set new water quality requirements for Great Bay. (Currier Dep. at 100-101, 140). Absent the application of the 2009 Criteria, the waters would not have been designated nutrient impaired. DES acknowledged that had planned to formally adopt the criteria prior to use in designating waters impaired or in setting permit limitations. (Currier Dep. at 143, 148-149). Under deposition, it was revealed that (1) EPA told DES to call the numeric criteria “translators” and thereby avoid the criteria adoption/approval process and (2) EPA pushed DES to declare Great Bay and the estuary nutrient impaired, because it wanted to avoid a lawsuit with CLF. (Currier Dep. at 78-79, 108-110). Both of these actions were highly inappropriate and demonstrate that EPA has been acting improperly in promoting nutrient reduction for Great Bay, in opposition to the requirements of the Act.

Impairment designations are required to be based on objective data, not avoidance of lawsuits. 40 CFR 130.6. The objective information presented to EPA at that time by DES, was that there was no cultural eutrophication and there was no nutrient induced transparency problem occurring in Great Bay. EPA was aware that the numeric nutrient criteria required adoption to conform to CWA requirements; however, EPA informed DES that it should violate the law by simply calling the numeric criteria a “narrative translator.” This was a gross violation of the Coalition community’s due process rights for public participation in criteria adoption as well as mandatory provisions of the Act (Section 101(e) and 303(c)). EPA needs to withdraw these permits promptly and request that DES begin the standards

adoption process if it wishes to use these criteria to declare waters impaired and set permit requirements.

Based on the above supplemental comments it is requested that the proposed permits for Exeter, Newmarket and Dover be withdrawn.

## **ATTACHMENTS**